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1881 - Prevention of fowl cholera.

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## DEPARTMENT OF AGRICULTURE,

WASHINGTON, D. C., February 23, 1881.

*To whom it may concern:*

I deem it advisable at this time to issue, in advance of the annual publication of the Department, the following brief but important paper, giving the results of some recent experiments made, under the direction of the Department of Agriculture, by D. E. SALMON, D. V. M., for the prevention of what is commonly known as Chicken Cholera. A detailed report of the investigation will be contained in the forthcoming annual publications of the Department.



Commissioner of Agriculture.



## PREVENTION OF FOWL CHOLERA.

Although the cholera of fowls is an exceedingly virulent and fatal disease, destroying vast numbers of birds of different species, and remaining on premises for years after being once introduced, we are satisfied, after a long series of experiments, that there are points in its natural history which enable us to control it with comparative ease and with a considerable degree of certainty. These points are:

1. *The virus is not diffusible.*—That is, the disease germs are seldom if ever taken up by the air and carried any considerable distance to produce the malady. The virus remains in the fixed form, and is generally, if not always, taken into the body with the food; it is distributed over the grounds, feeding-places, etc., in the excrement of affected birds, and the food, drink, and gravel are thus contaminated. Healthy birds may be kept in coops within a few feet of the sick ones for months without contracting the disease; but if the former are now placed in the same inclosure with the latter they sicken in a few days.

2. *The virus must be carried upon the grounds frequented by fowls before they contract the disease.*—It is not probable that this disease originates, in any considerable number of cases, in any other way than by contagion. There is a possibility that it may originate in occasional instances by filthy surroundings if closely confined, or by feeding on decomposing substances; but there are few facts to support such a conclusion, and it appears certain that in the vast majority of cases the disease is imported and kept up by contagion alone.

It is thus brought upon farms either (1) with sick or infected fowls newly acquired, (2) with the blood or parts of the bodies of dead birds carried on the feet of people or brought by dogs or other animals, (3) with infected manure or feathers, or (4) possibly by wild birds, animals (rabbits), or even insects that have contracted the disease or have eaten the blood or bodies of affected birds recently dead. The origin of the disease can generally be traced in country districts, where houses are a considerable distance apart, to recently acquired poultry. It is only in districts more thickly peopled, and then in exceptional instances, that the germs are carried by wild birds or animals or by insects.

## PREVENTIVE MEASURES FOR GROUNDS ALREADY INFECTED.

1. *Is the disease cholera?*—Fowls frequently die in considerable numbers from diseases that are not contagious, and hence it is a matter of primary importance to decide as to the nature of the affection when cholera is suspected. In my own experience I have found that this might be done with comparative certainty by inspection of the excrements. With fowls the excretions of the kidneys are joined in the cloaca with the undigested parts of the food, and both solid and liquid excrement are consequently voided together. They are not mixed to any great extent, however; the part excreted by the kidneys is easily distinguished, as during health it is of a pure white color, while the bowel discharges are of various hues. The kidney excretion will be hereafter referred to as *the urates*, and it is the only part which claims our attention.

After a fowl takes the contagion into its body the first and only reliable symptom is a coloration of the urates. At first these have only a faint yellow tint, which rapidly changes, however, into a deep yellow color; up to this time the bird shows no other signs of the disease, its temperature is unchanged and its excrement of a normal consistency. In one or more days after this yellow color appears the urates are greatly increased in quantity and constitute the whole or a greater part of the discharges and an obstinate diarrhoea sets in; in a few cases the urates now become greenish, and exceptionally they are of a deep green color.

The only lesion seen in post-mortem examinations that is likely to attract the attention of non-professional observers is the enlarged liver, which is nearly constant—it may be of various shades of color. Besides this the presence of yellow urates in the cloaca and ureters is a valuable sign and is generally present.

2. *Sick birds must be destroyed.*—The excrements of sick birds are the principal means of spreading the contagion, and the first step in stamping out the disease is, consequently, to destroy all which are voiding yellow urates. Care should be had to make the distinction between the urates and the bowel dejections, for the latter are frequently of a yellow color in health; but a little observation will preclude any mistake of this kind. The killing should not be by any method which allows the escape of blood, as this fluid is even more virulent than the excrement; wringing the neck is a quick and easy method of destroying the life. Once killed the bodies are to be taken beyond the limits of the poultry run and deeply buried.

If it is decided to keep the sick birds till they die or recover, they should be placed in an inclosure by themselves, as far as possible from the healthy ones, where they may be cared for without entering, so that there will be no danger of carrying particles of the excrement on the boots and spreading the infection.



3. *Healthy birds must be placed on disinfected grounds.*—If a piece of land is at hand to which the sick birds have not had access and which is consequently free from the contagion, the healthy birds should be penned upon it; but if all of the land is infected, then a piece is to be selected and thoroughly disinfected with the solution mentioned further on in this paper. The fowls are to be restricted to this disinfected ground for several months, or even a year or more, if practicable. The drinking vessels and feeding troughs are to be new, or if used before they must be soaked for twelve hours with the same solution before being placed in the new inclosure.

4. *Observations to be continued to note the first re-appearance of the disease.*—Some of the fowls, though well at the time of removal to disinfected quarters, may be infected with the disease, and after the period of incubation, which varies from three to twenty days, will sicken. It is necessary, therefore, to make a careful inspection of the excrement each morning for at least three weeks after the separation of the sick fowls. If yellow urates are discovered, the birds must be watched until the sick one is detected. To facilitate the early discovery of such sick fowls and prevent infection of the healthy ones it is advisable, where practicable, to separate the birds into lots of two or three each at the start; and this separation may always be practiced as a last resort where the disease successfully defies our efforts for a considerable time; but where this is impossible a little patience will generally enable one to pick out the sick before any harm has resulted. As soon as the sick bird is removed the excrement must be scraped up and burned, and the run must be again sprinkled with the disinfectant; or, the well birds may be changed to fresh ground as before. This method of management is to be continued as long as new cases of the disease occur.

By a careful observance of these rules one can frequently check the disease with a loss of but one or two fowls out of a large flock.

5. *Disinfection.*—For this disease we have a very cheap and most effective disinfectant. It is a solution made by adding three pounds of sulphuric acid to forty gallons of water (or  $\frac{1}{2}$  lb. of acid to  $3\frac{1}{2}$  gallons of water) and mixing evenly by agitation or stirring. This may be applied to small surfaces with a common watering-pot, or to larger grounds with a barrel mounted on wheels and arranged like a street-sprinkler. In disinfecting poultry houses the manure must be first thoroughly scraped up and removed beyond the reach of the fowls; a slight sprinkling is not sufficient, but the floors, roosts, and grounds must be thoroughly saturated with the solution, so that no particle of dust however small escapes being wet. It is impossible to thoroughly disinfect if the manure is not removed from the roosting places.

Sulphuric acid is very cheap, costing at retail not more than twenty-five cents a pound and at wholesale but five or six cents; the barrel of disinfecting solution can, therefore, be made for less than a dollar and should be thoroughly applied. It must be remembered, too, that sulphuric acid is a dangerous drug to handle, as when undiluted it destroys clothing and cauterizes the flesh wherever it touches. The safest way is, therefore, to take a five-gallon keg nearly full of water to the druggist and have him place the strong acid in this; the contents of the keg may then be safely transported and added to the barrel of water.

6. *Fumigation.*—In those cases where the disease has been raging for a considerable time the feathers become saturated with the contagion and it is necessary, before placing the fowls on the disinfected run, to put them in a close building and thoroughly fumigate them with sulphur. For this purpose a pan of burning coals is taken and flowers of sulphur thrown upon them as long as the air can be breathed without danger of suffocation. When the disease is recognized at the outset this is not necessary.

#### PREVENTIVE MEASURES FOR GROUNDS NOT YET INFECTED.

1. *Newly acquired birds to be isolated.*—When cholera is raging in a locality, all birds introduced from other flocks should be placed in an inclosure by themselves for at least three weeks, until it is certain that they are free from the disease. No fowls should be accepted from a place known to be infected for at least a year after the last-known cases occur.

2. *Precautions in regard to eggs.*—All eggs from a distance to be used for hatching must be thoroughly cleaned of all particles of excrement adhering to them, and the water with which they are washed, as well as cloths or brushes used, must be raised to the boiling point before being thrown upon grounds to which poultry has access. The virus is always destroyed by a boiling temperature, or even by 140° F., if maintained for fifteen minutes.

3. *Fowls not to wander upon adjoining infected premises.*—A stone wall is, in towns, frequently the boundary line of an infected place, and though fowls are upon each side of it the contagion may not cross for years. In such cases it is a matter of the greatest importance to prevent the healthy fowls from trespassing upon the infected grounds.

4. *Fowls from neighboring infected premises to be rigidly excluded.*—If it is important to keep healthy fowls from infected grounds, it is not less important to exclude fowls living in infected quarters from entering on runs that are still free from the disease. Even though insusceptible to cholera and, consequently, healthy, they are able to carry the virus on their feathers and feet and may even distribute it with their own excrement; for although the virus is unable to propagate itself in the blood and tissues of insusceptible birds, there is reason to believe that it may still multiply in the contents of their digestive organs.

5. *Other infected substances to be excluded from the runs.*—Manure from infected places is often purchased and spread upon land to which healthy poultry has access and thus becomes a means of spreading the disease. This should either be entirely excluded from the farm or the fowls should not be allowed to come near where it is placed. It cannot be safely disinfected. Feathers and dead birds are also at times carried a considerable distance by various agencies and should be guarded against when possible.

By a careful observance of these rules the fowl cholera may be excluded indefinitely, and may be exterminated when it has made its appearance. The writer has had a very virulent form of the disease among experimental fowls for nearly eight months, and though his home flock is but a short distance from them, but a few of these have sickened, and then the disease has been checked with the loss of a single bird in each instance. It is believed that the birds which thus contracted the disease were infected by flies, which would gorge themselves with virulent blood in the laboratory, where dissections were made, and then fall victims to the poultry which were running about outside. No cases have occurred in this manner since the cold weather has destroyed these insects.

The experiments on which the above regulations are founded will be detailed in future reports of this Department; they are sufficiently numerous to be worthy of the fullest confidence.

The value of the method of preventive inoculation or vaccination discovered by Pasteur has not yet been decided, but in view of the comparative ease with which the affection may be controlled by the measures detailed above we doubt if it can ever be advantageously adopted as a means of preventing this particular disease.

D. E. SALMON, D. V. M.

Asheville, N C., February 18, 1881.

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